

Trichosanthes odontosperma W.E.Cooper & A.J.Ford (Cucurbitaceae), a new species from Queensland's Wet Tropics

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Summary

Cooper, W.E. & Ford, A.J. (2010). *Trichosanthes odontosperma* W.E.Cooper & A.J.Ford (Cucurbitaceae), a new species from Queensland's Wet Tropics. *Austrobaileya* **8(2)**: 125–131. *Trichosanthes odontosperma* W.E.Cooper & A.J.Ford is described and illustrated. Notes on habitat, distribution, and conservation status are provided.

Key Words: Cucurbitaceae, *Trichosanthes*, *Trichosanthes odontosperma*, *Trichosanthes* section *Edulis*, Australia flora, Queensland flora, new species

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Introduction

Trichosanthes L. (Cucurbitaceae) is a genus of approximately 100 species of vines, distributed from India and China to Australia and the eastern Pacific (Rugayah & de Wilde 1999). Currently six species of *Trichosanthes* are recorded for Australia (Telford 1982; Harden 1990; Cooper & Cooper 2004), with four species being considered endemic: *Trichosanthes pentaphylla* F.Muell. ex Benth., *Trichosanthes subvelutina* F.Muell. ex Cogn., *Trichosanthes holtzei* F.Muell. and *Trichosanthes odontosperma* described herein. *Trichosanthes* species occur in tropical and subtropical vegetation, primarily rainforest, monsoon forest, vine thickets and sparsely vegetated rocky outcrops.

Trichosanthes is placed in the subfamily *Cucurbitoideae* Endl., tribe *Trichosantheae* C.Jeffrey and subtribe *Trichosanthiniae* Pax (Jeffrey 2005; Kocyan *et al.* 2007). The subtribe *Trichosanthiniae* contains only one additional genus, *Gymnopetalum* Arn., which has four species distributed from India to China and Malesia. These two genera can be distinguished by the presence or absence of corolla fringes and overall shape of the folded petals in mature bud (de Wilde & Duyfjes 2006). In addition, the morphology and presence of probracts within *Trichosanthes*

has been shown to be an important taxonomic feature (Duyfjes & Pruesapan 2004), which has not been previously reported for Australian species. A revision of Australian species of *Trichosanthes* is currently in progress (Cooper & de Boer, unpublished).

The species described below as *Trichosanthes odontosperma* has been known as *Trichosanthes* sp. A (Telford 1982), *Trichosanthes* sp. (Mt Lewis) (Cooper & Cooper 1994; Cooper & Cooper 2004) and *Trichosanthes* sp. (Mt Lewis B.Gray 167) (Hyland *et al.* 2003; Edginton 2007). The flowers open at night and have mostly shrivelled and disintegrated by early morning, making collections of quality material problematic. Furthermore, this species (like most *Trichosanthes*) is dioecious, with female flowers being particularly difficult to procure. Accordingly, a paucity of suitable collections with adequate duplicates until now has probably led to a lack of enthusiasm for describing this taxon.

Materials and methods

The study is based upon the examination of herbarium material from BRI, CANB, CNS and NSW with field observations by the first author. All specimens cited have been seen by one or both authors. Length and width dimensions are indicated as length × width followed by the measurement unit.

Flowers do not usually occur in abundance, appearing mostly in ones and twos, therefore for this study collections from the same plant were made over a few weeks to gather enough material for an adequate description. Measurements of the floral parts and fruits are based on material preserved in 70% ethanol as well as fresh material from the field. Abbreviations in the specimen citations are: L.A. (Logging Area) and S.F.R. (State Forest Reserve). The abbreviation RE in the distribution and habitat notes refers to Regional Ecosystem, descriptions of which can be viewed at www.derm.qld.gov.au/wildlife-ecosystem/biodiversity/regional_ecosystems/index.php

Taxonomy

Trichosanthes odontosperma W.E.Cooper & A.J.Ford, **species nova** a *T. subvelutina* F.Muell. ex Cogn., probracteis linearibus, foliis glabris vel glabrescentibus, bracteis racemorum masculorum 3–4 mm longis, receptaculitubo florum masculorum et feminearum abaxialiter glabro vel glabrescenti, fructibus aurantiacis vel rubris, et seminibus lobatis dentatisque differt. **Typus:** Queensland. COOK DISTRICT: Westcott Road, Topaz, 15 April 2009, *W.E.Cooper 2065* (holo: CNS [2 sheets + spirit] [7 sheets to be distributed to BRI, CANB, DNA, L, MO, NSW & UPS).

Trichosanthes sp. A (Telford 1982: 196).

Trichosanthes sp. (Williams 1987: 306; Jones & Gray 1988: 350).

Trichosanthes sp. (Mt Lewis) (Cooper & Cooper 1994: 610; Cooper & Cooper 2004: 144).

Trichosanthes sp. (Mt Lewis BG 167) (Hyland *et al.* 2003).

Trichosanthes sp. (Mt Lewis B.Gray 167) (Edginton 2007: 54).

Illustrations: Cooper & Cooper (1994: 291), as *Trichosanthes* sp. (Mt Lewis); Cooper & Cooper (2004: 145), as *Trichosanthes* sp. (Mt Lewis); Hyland *et al.* (2003), as *Trichosanthes* sp. (Mt Lewis BG 167); Jones & Gray (1988: 354 & back cover), as *Trichosanthes* sp.; Williams (1987: 307), as *Trichosanthes* sp.

Dioecious trailing vine or liana to mid-canopy with stems to 3 cm diameter at base, perennial, partially or completely seasonally senescent. Stems and young branchlets 5-angular, glabrescent with minute multicellular trichomes clustered at nodes; bark fissured and corky on older growth; nodes often markedly swollen. **Probracts** on nodes beside petioles, caducous, linear or narrowly ovate, minutely lobed or with a few teeth, 3–13 × 1–3 mm, glandular, glabrous or glabrescent. **Tendrils** arising beside petiole, unbranched or 2- or 3-branched. **Leaves** simple, alternate, petiolate, discolorous, glabrous or glabrescent; petiole 20–95 mm long; lamina ovate, cordate or triangular, unlobed or rarely 3-lobed, 50–190 × 41–160 mm, leathery, base cordate or rarely hastate, sinus mostly narrow and deep; apex acuminate to acute, with or without a soft mucro; margin denticulate with 13–27 teeth per side; upper side smooth, glabrous or with sparse, minute, translucent-white multicellular trichomes on main veins; numerous small, translucent and sunken multicellular (rosette-shaped) cystoliths, which in most dried specimens become black and flush or slightly protruding; midrib flush in fresh specimens and slightly sunken when dried; underside with sparse, minute, translucent-white multicellular trichomes on main veins, 1–16 circular and flat glands on each side of the leaf base; primary lateral veins usually 3 on each side of midrib, at 45–75° to the midrib; intralateral veins reticulate. **Inflorescence** arising beside petiole, solitary, in pairs or racemose; flowers unisexual, epigynous, fragrant, 4 or mostly 5-merous, actinomorphic. **Male flowers** mostly solitary, rarely a fascicle of two flowers or a raceme beside a solitary flower, 45–90 mm diameter; bracts narrowly ovate, glabrous, 5–17 × 1–3 mm, at the base of racemose flowers; peduncle 35–110 mm long; pedicel 43–83 mm long. Receptacle tube green or creamy-green with a narrow bright yellow centre, adaxial surface of tube yellow, 45–90 mm long, salverform, glabrous or glabrescent abaxially; sepals usually 5 (rarely 4), free, green, triangular, entire or with 1–3 teeth, glabrous or glabrescent, 8–20 × 2–4 mm; petals 5 (rarely 4), fused, white, obdeltoid, length including fimbriations 27–40 × 24–40 mm,

both surfaces villous becoming glabrescent towards apex; fimbriations simple or forked, up to 16 mm long. Stamens 3, included, free until anthesis, becoming connate, filaments 2–5 mm long, glabrous; anthers oblong, s-shaped, 8–11 mm long, two bilocular and one unilocular, basifixed. **Female flowers** solitary, 60–73 × 55–65 mm; peduncle 31–50 mm long, bracts absent. Receptacle tube green or creamy-green with a narrow bright yellow centre, adaxial surface of tube yellow, 39–55 mm long, salverform, glabrous or glabrescent abaxially; sepals 5, green, triangular, entire, glabrous or glabrescent, 5–12 × 1–2 mm; petals 5, white, obdeltoid, 28–31 mm long, both surfaces villous, fringe glabrescent; style *c.* 25 mm long. Stigma bifid, *c.* 6 mm long. Ovary 14–24 mm long, glabrous and 10-ribbed externally; ovules numerous, in (vertical) longitudinal rows, *c.* 1 mm long. **Fruit** a pepo or berry, ovoid or ellipsoid, apex beaked, 90–140 × 60–90 mm, glabrous, longitudinally 10-ribbed, orange to red; peduncle 25–40 (or more, based upon flowering specimens) mm long, 4–10 mm wide; mesocarp yellow-orange, firm, 10–13 mm thick; seeds numerous, quadrangular, suspended in orange or red pulp, 1-celled, 2-horned at one end, 4-lobed at the other end, both sides with 2 rows of 2–10 teeth, 12–18 mm long, 6.3–7.7 mm wide, 3–4 mm thick; testa brown to blackish; endosperm absent; radicle *c.* 1 mm long, much shorter and narrower than the cotyledons. Germination epigeal (phanerocotylar); cotyledons elliptic, 14–23 × 6–9 mm. *Rainforest gourd*. **Fig. 1.**

Additional selected specimens (from 34 examined):
Queensland. COOK DISTRICT: Adeline Creek Road, Oct 1993, *Le Cussan 238* (CNS); Mt Lewis, May 1975, *Gray 167* (CNS); S.F.R. 143, Windmill L.A., Feb 1976, *Hyland 8607* (CNS); 4.5 km from Whyanbeel on track to Stewart Creek, 13.7 km NW of Mossman, Nov 1988, *Jessup et al. GJM 508* (BRI); S.F.R. 194, Western, Cpt 55, Oct 1991, *Hyland 14275* (CNS); Tinaroo Range, Downfall Creek Road, Feb 1962, *Webb 5757* (BRI); Kennedy Road, junction with Kennedy Highway, Mar 2000, *Gray 7804* (CNS); Stockwellia Track, May 1996, *Jensen 766* (CNS); Swipers L.A., S.F.R. 310, Aug 1981, *Gray 20187V* (CNS); Topaz N.P., April 2009, *Cooper 2066* (CNS); Westcott Road, Topaz, Jan 1992, *Cooper 151* (CNS); *loc. cit.*, Jun 1999, *Cooper 1240* (CNS); *loc. cit.*, Jun 1999, *Cooper 1255* (CNS); *loc. cit.*, Apr 2009, *Cooper 2058* (CNS); Towalla, Oct 1994, *Cooper 844* (CNS); Near junction of Dirran River and Millaa Millaa railway line, Mar 1945, *Thurston 640* (CNS); 22 km south of Atherton on road to

Ravenshoe, April 2002, *Bean 18909* (BRI); S.F.R. 755, North Johnstone L.A., Nov 1977, *Dockrill 1406* (CNS); S.F.R. 650, Mt Fisher, Oct 1978, *Gray 1044* (CNS); Tully Falls, Dec 1947, *Fielding Cairns 1* (CNS). NORTH KENNEDY DISTRICT: S.F.R. 605, Culpa Road, 3.7 km from O'Leary Creek Bridge, site 53, May 2002, *Ford 3382 & Holmes* (BRI, CNS).

Distribution and habitat: *Trichosanthes odontosperma* is endemic to the Wet Tropics bioregion in north-eastern Queensland, where it is currently known to occur from the Windsor Tableland area, west of Cape Tribulation, to the Cardwell Range, west of Tully (**Map 1**). It inhabits predominantly wetter and more mountainous notophyll or mesophyll vineforests/rainforests on soils derived from basalt, rhyolite, mudstones and granite. Although it occurs over a wide geographical area, common canopy species throughout most of its range include: *Argyrodendron peralatum* (F.M.Bailey) Edlin ex Boas, *Beilschmiedia bancroftii* (F.M.Bailey) C.T.White, *Cardwellia sublimis* F.Muell., *Cryptocarya mackinnoniana* F.Muell., *Cryptocarya oblata* F.M.Bailey, *Doryphora aromatica* (F.M.Bailey) L.S.Sm., *Endiandra montana* C.T.White, *Ficus pleurocarpa* F.Muell., *Flindersia brayleyana* F.Muell., *Franciscodendron laurifolium* (F.Muell.) B.Hyland & Steenis, *Syzygium gustavioides* (F.M.Bailey) B.Hyland and *Sloanea macbrydei* F.Muell. Common small trees and shrubs throughout most of its range include: *Apodytes brachystylis* F.Muell., *Atractocarpus hirtus* (F.Muell.) Puttock, *Delarbrea michieana* (F.Muell.) F.Muell., *Gossia dallachiana* (F.Muell. ex Benth.) N.Snow & Guymer, *Rockinghamia angustifolia* (Benth.) Airy Shaw and *Wilkiea angustifolia* (F.M.Bailey) J.R.Perkins.

Trichosanthes odontosperma appears to be favoured by disturbance, and is frequently seen on rainforest margins and in tree-fall gaps, especially on soils derived from basalt. Altitudinal range is 60–1160 m, although there appears to be a preference between 600 m and 1000 m.

Trichosanthes odontosperma has been recorded or reliably reported in the following regional ecosystems (REs): 7.3.36a (rarely), 7.8.1a (rarely), 7.8.2a (commonly), 7.8.4a (commonly), 7.8.4c (rarely), 7.11.1a (rarely), 7.11.2a (rarely) and 7.12.16a (commonly).

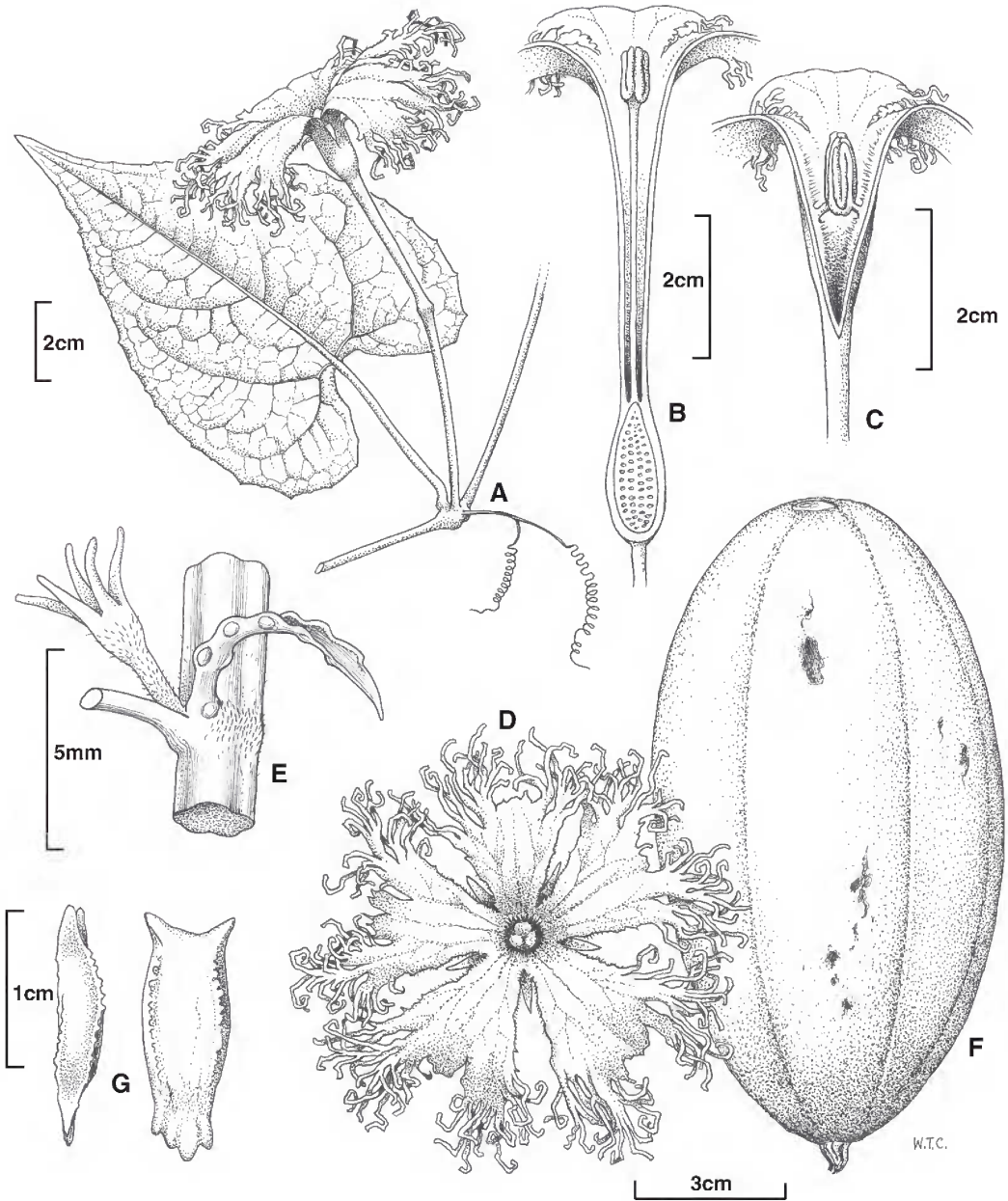


Fig. 1. *Trichosanthes odontosperma*. A. flowering node (male plant) with mature leaf and tendrils. B. female flower lateral view longitudinal section. C. male flower lateral view longitudinal section showing s-shaped anthers. D. male flower face view. E. glandular probract and immature flower bud. F. fruit lateral view. G. lateral view of seed (left), adaxial view of seed (right). Scales as indicated. A, C, D, E Cooper 2065 (CNS); B Cooper 2067 (CNS); F, G Cooper 844 (CNS). Del. W.T.Cooper.

Phenology: Flowers have been recorded in all months; fruits have been recorded in January, March, April, June, July, August, October and November.

Notes: The flowers of *Trichosanthes odontosperma* open during the evening and before they unfurl are commonly visited by numerous small scuttleflies belonging to the family Phoridae (**Fig. 2**). The flowers smell strongly of sweet coconut and the flies are often still on them as they disintegrate. In warm weather, this occurs during the

following morning. In cool wet weather the flowers may remain on the plant in reasonable condition for about 24–36 hours. Stems are usually leafless and dying when ripe fruits are present.

Affinities: *Trichosanthes odontosperma* belongs in *T.* section *Edulis* Rugayah along with eight other species from New Guinea (Rugayah & De Wilde 1999) and is the only Australian representative of this section. *Trichosanthes* section *Edulis* is distinguished from the other four sections



Fig. 2. Male flowers of *Trichosanthes odontosperma* being visited by scuttleflies (Phoridae).

in the genus by the combination of dioecy, presence of probracts, red fruit pulp, and seed morphology (quadrangular and notched or toothed) (Rugayah & de Wilde 1999). Within Australia, the flowers of *T. odontosperma* are most similar to *T. subvelutina* from section *Foliobracteola* Cheng & Yueh (Rugayah & De Wilde 1999). *T. subvelutina* is endemic to southeast Queensland and northeast New South Wales and has persistent, ovate, quadrate or broadly triangular probracts, pubescent or hirsute leaves and receptacle-tube, greenish-white fruit pulp and seeds with entire margins. Bracts on male racemes of *T. subvelutina* are 19–33 mm long compared with 5–17 mm long in *T. odontosperma*.

Conservation status: Most existing collections of *Trichosanthes odontosperma* have been made within the World Heritage Area of the Wet Tropics. *T. odontosperma* has been collected in Daintree, Maalan, Wooroonooran and Tully Falls National Parks. The extent of occurrence is estimated to be no less than 2390 km² and occurs over a large, but narrow, geographical area. Accordingly it is not considered at risk or under threat at this time.

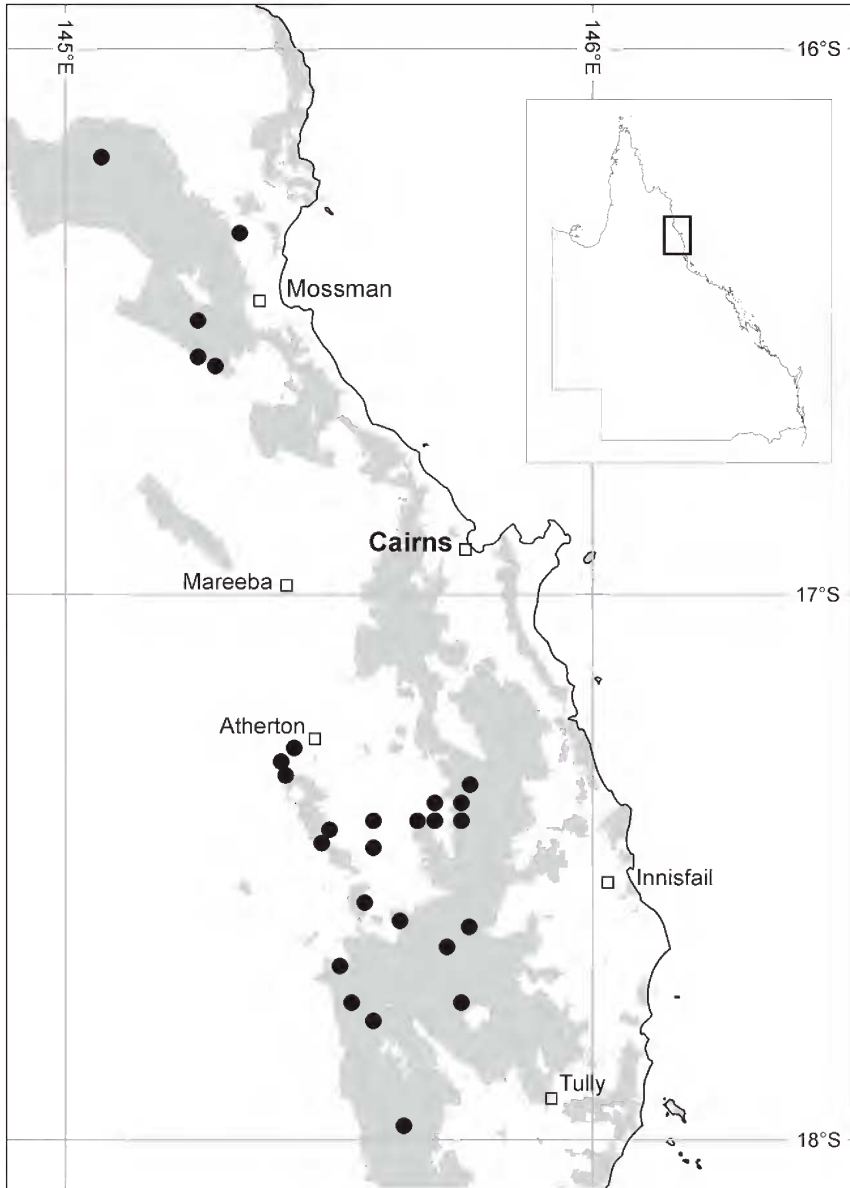
Etymology: The specific epithet is derived from the Greek, *odonto* (tooth) and *-sperma* (seed) and refers to the toothed seeds, distinguishing it from all other Australian *Trichosanthes*.

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Map 1. Distribution of *Trichosanthes odontosperma* (●) in north-east Queensland. Shaded area on map indicates nature conservation reserves (National Parks, Forest Reserves and Conservation Parks).